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# RTD UPDATES: Chemical Use Practices

Data updates from the Resources and Technology Division

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## Chemical Application Timing and Method on 1993 Major Field Crops, by State

- Chemical application timing and methods varied considerably among the major field crops.
- Fertilizer was more frequently applied before planting to corn, soybeans, and winter wheat, at planting to durum and spring wheat, and after planting to cotton and fall potatoes.
- Herbicides were most frequently applied after planting to most crops but upland cotton. Insecticides were most frequently applied at planting to corn and after planting to upland cotton and fall potatoes.

This issue of **RTD UPDATES** summarizes 1993 chemical input practices for the 10 major corn, 14 soybean, 6 upland cotton, 4 spring wheat, 1 durum, 13 winter wheat, and 11 fall potato growing States. Chemical use practices are reported for the proportion of planted acres treated as well as the proportion of acre-treatments. Acre-treatments are defined as acres treated times the number of times applied.

**Corn.** Applying fertilizer in the spring before planting was the most common timing practice followed by at-planting applications. Broadcast with ground equipment was the most common method of applying fertilizer. Herbicides were often applied after planting as ground broadcast treatments. Insecticides were commonly applied at planting as banded or in-furrow treatments.

**Soybeans.** Growers most commonly applied fertilizer in the

spring before planting as ground broadcast treatments. Herbicides were frequently applied after planting, but a significant proportion was applied before planting, as ground broadcast treatments.

**Cotton.** Fertilizer was generally applied before planting in the spring and after planting as ground broadcast treatments. Herbicide treatments were most commonly applied before planting but a significant proportion was also applied at or after planting. Insecticides were generally applied after planting as broadcast treatments (ground or air).

**Spring and durum wheat.** Fertilizer was generally applied at planting as banded treatments. Herbicides were applied after planting as ground broadcast treatments. Winter wheat growers applied most of their fertilizer in the fall before planting. A significant proportion of wheat acreage was also top-dressed in the spring.

**Fall potatoes.** After planting was the most common time for applying fertilizer chiefly as a ground broadcast treatment although banded and chemigation (applied with irrigation water) methods were also common. Herbicides were generally applied after planting as ground broadcast treatments. Insecticides and fungicides were also applied after planting as broadcast treatments.

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### About RTD UPDATES

**RTD UPDATES** is a semimonthly series featuring data relating to agricultural resources, the environment, food safety, and technology. These **UPDATES** report recent data from surveys of farm operators and others knowledgeable about changing agricultural resource conditions, with only minimal interpretation or analysis. Please contact the individual listed at the end of the text for additional information about the data in this **UPDATE**. If you would like to be added to the mailing list or have other questions about **RTD UPDATES**, contact Richard Magleby, (202) 219-0436.

### Chemical Application Timing: 1993 Corn

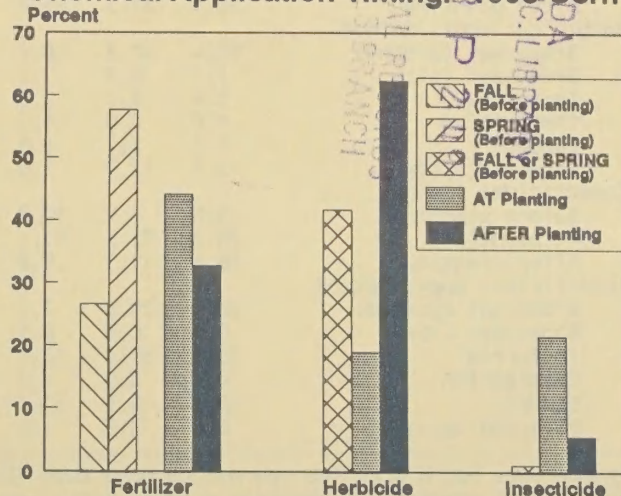




Table 1--Chemical input practices on corn for grain, major producing States, 1993

Practice 1/	IL	IN	IA	MI	MN	MO	NE	OH	SD	WI	Total
Planted acres (million) 2/	10.5	5.55	12.0	2.50	6.30	2.20	8.00	3.50	3.35	3.40	57.30
----- Percent of acres -----											
Fertilizer: timing											
Fall before planting	40.6	31.1	25.4	21.6	26.8	20.1	15.7	26.4	28.6	13.9	26.7
Spring before planting	71.1	56.8	67.7	46.8	63.6	58.6	41.0	54.8	40.6	33.5	57.8
At planting	13.3	68.9	23.3	91.0	47.0	15.2	61.7	76.0	37.6	87.3	44.3
After planting	31.5	42.4	24.3	52.8	18.0	20.9	47.6	57.8	17.1	25.4	32.9
Fertilizer: appl. method											
Broadcast (ground)	89.5	85.8	76.7	60.8	67.3	83.2	42.7	79.7	61.1	40.8	70.9
Broadcast (air)	1.2	1.1	1.3	1.3	0.0	2.5	2.3	2.8	1.3	1.2	1.4
Chemigation	0.3	0.4	0.0	0.7	0.0	1.6	3.2	0.0	0.0	0.0	0.6
Banded	11.9	62.7	22.6	87.7	50.9	9.8	55.5	75.8	32.1	86.4	42.2
Foliar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0
Injected (knifed in)	52.1	54.7	47.5	48.5	45.2	16.4	60.2	48.7	29.1	27.5	42.4
Herbicide: timing											
Before planting	66.2	49.0	59.2	15.8	36.0	47.7	15.4	23.6	28.4	13.6	41.8
At planting	8.6	20.1	10.9	17.5	13.5	23.6	47.1	25.8	26.7	6.1	19.1
After planting	51.7	47.7	66.8	75.5	87.6	30.0	55.0	68.0	64.2	80.0	62.5
Herbicide: appl. method											
Broadcast (ground)	93.1	82.1	92.4	70.5	81.9	77.6	53.0	78.6	64.2	77.1	79.9
Broadcast (air)	1.6	0.0	1.8	0.0	1.3	1.3	3.5	6.3	7.7	1.5	2.3
In-furrow	0.5	2.0	0.2	0.7	1.5	0.8	3.9	1.1	0.7	2.6	1.4
Chemigation	0.1	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Banded	2.3	4.6	10.1	10.7	13.9	8.0	45.5	8.2	22.8	3.5	13.8
Directed spray	2.6	14.0	4.2	20.1	15.4	4.6	2.5	6.9	8.1	11.3	7.4
Insecticide: timing											
Before planting	1.8	1.8	0.3	0.3	0.2	4.6	1.4	2.0	1.1	0.0	1.2
At planting	25.2	22.8	29.9	26.2	7.4	7.2	24.7	13.6	9.1	26.1	21.7
After planting	5.3	3.3	2.0	0.7	0.6	1.3	24.4	2.6	1.8	2.6	5.7
Insecticide: appl. method											
Broadcast (ground)	7.1	7.2	2.3	3.7	0.6	6.3	3.5	6.1	2.1	2.0	4.0
Broadcast (air)	0.0	0.7	0.2	0.0	0.0	0.0	14.1	0.2	0.7	0.0	2.1
In-furrow	5.8	8.3	9.6	7.1	4.0	4.6	10.3	5.0	0.7	8.1	7.1
Chemigation	0.1	0.0	0.0	0.0	0.0	0.0	0.9	0.4	0.0	0.0	0.2
Banded	18.7	11.4	19.4	15.8	3.4	1.7	23.4	6.3	7.7	13.0	14.9
Directed spray	0.1	0.9	0.5	0.7	0.2	0.0	0.0	0.2	0.0	0.0	0.3
Average treatments/treated acre											
Fertilizer	2.44	2.59	1.71	2.35	1.89	1.23	1.97	2.62	1.34	1.72	2.07
Herbicide 3/	1.44	1.34	1.52	1.22	1.57	1.19	1.39	1.47	1.52	1.25	1.43
Insecticide 3/	1.01	1.05	1.01	1.01	1.00	1.00	1.18	1.00	1.00	1.00	1.05
----- Percent of acre-treatments -----											
Fertilizer: timing											
Fall before planting	30.5	15.8	17.7	9.7	17.0	16.7	8.5	12.9	22.3	8.6	17.9
Spring before planting	49.9	34.8	53.4	23.3	46.7	52.3	24.2	28.9	34.7	23.7	40.1
At planting	6.3	32.0	14.7	43.5	26.4	13.0	36.6	34.0	30.3	52.4	24.5
After planting	13.3	17.4	14.2	23.4	9.9	18.0	30.7	24.2	12.7	15.3	17.6
Fertilizer: appl. method											
Broadcast (ground)	72.1	50.0	56.9	33.9	47.2	72.3	25.8	45.9	49.7	29.2	50.9
Broadcast (air)	.8	.5	.9	.7	0.0	2.3	1.2	1.2	1.0	1.2	.8
Chemigation	0.1	0.2	0.0	0.3	0.0	1.3	2.4	0.0	0.0	0.0	0.4
Banded	5.5	27.4	14.2	44.5	28.4	10.7	35.8	33.9	26.8	53.1	23.6
Foliar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0
Injected (knifed in)	21.5	22.0	28.1	20.6	24.5	13.3	34.9	18.9	22.6	16.5	24.2
Herbicide: timing											
Before planting	54.2	42.8	43.4	13.6	21.2	47.8	12.2	17.8	24.0	11.4	32.9
At planting	7.4	17.7	7.4	14.8	8.0	24.9	40.4	22.0	20.0	5.4	15.5
After planting	38.5	39.5	49.2	71.6	70.8	27.3	47.4	60.2	56.0	83.2	51.5
Herbicide: appl. method											
Broadcast (ground)	93.9	81.8	88.7	70.2	76.9	84.9	50.3	79.6	66.1	82.4	79.2
Broadcast (air)	1.7	0.0	1.5	0.0	0.7	1.4	3.0	6.3	7.3	1.2	2.0
In-furrow	0.4	2.0	0.0	0.5	1.5	0.9	3.1	0.7	0.8	2.0	1.2
Chemigation	0.0	0.0	0.0	0.7	0.0	0.0	0.2	0.0	0.0	0.0	0.0
Banded	1.8	3.7	6.8	9.0	8.8	8.4	41.4	7.6	19.0	3.6	11.4
Directed spray	2.1	12.5	3.0	19.6	12.1	4.4	2.0	5.8	6.7	10.9	6.2
Insecticide: timing											
Before planting	5.5	6.5	10.2	0.6	2.6	35.5	2.6	10.7	8.8	0.0	4.0
At planting	78.2	82.3	93.1	96.9	89.7	54.8	49.3	75.0	76.5	90.9	76.5
After planting	16.4	11.3	5.8	2.5	7.7	9.7	48.2	14.3	14.7	9.1	19.5
Insecticide: appl. method											
Broadcast (ground)	22.1	25.0	7.1	13.1	7.7	50.0	7.4	33.3	18.8	7.2	14.3
Broadcast (air)	0.0	0.8	0.5	0.0	0.0	0.0	26.0	1.2	6.3	0.0	6.7
In-furrow	18.3	30.6	30.1	25.6	48.7	36.7	19.6	27.4	6.3	28.9	24.9
Chemigation	0.4	0.0	0.0	0.0	0.0	0.0	1.5	2.4	0.0	0.0	0.5
Banded	58.7	40.3	60.7	58.8	41.0	13.3	45.6	34.5	68.8	63.9	52.5
Directed spray	0.4	3.2	1.5	2.5	2.6	0.0	0.0	1.2	0.0	0.0	1.0

1/ Percents for a practice may add to more than 100 since an acre can be treated more than once with a same or a different practice. 2/ Revised planted acres, June 1994. 3/ Excludes spot treatments.  
Source: Cropping Practices Survey, USDA.



Table 2--Chemical input practices on soybeans, major producing States, 1993

Practice 1/	Southern soybeans							Northern soybeans							Total
	AR	GA	KY	LA	MS	NC	TN	IL	IN	IA	MN	MO	NE	OH	
Planted acres (million) 2/	3.50	0.60	1.17	1.30	2.00	1.30	1.05	9.10	4.90	8.50	5.40	4.20	2.60	4.10	51.67
----- Percent of acres -----															
Fertilizer: timing															
Fall before planting	30.8	39.4	33.8	40.9	39.0	15.1	24.1	48.6	39.6	39.7	14.9	31.8	17.0	36.9	35.0
Spring before planting	60.0	43.6	48.5	40.9	58.5	57.5	72.3	45.2	47.7	49.2	61.2	59.1	36.2	54.5	52.3
At planting	13.1	19.1	16.2	13.6	2.4	30.2	8.4	9.6	14.8	6.3	19.4	7.6	34.0	9.6	13.2
After planting	0.8	1.1	2.9	4.5	0.0	1.9	0.0	1.4	4.7	4.8	6.0	1.5	12.8	1.5	2.8
Fertilizer: appl. method															
Broadcast (ground)	96.9	83.0	91.2	95.5	97.6	80.2	95.2	95.2	91.3	87.3	77.6	95.5	57.4	92.9	90.2
Broadcast (air)	3.1	0.0	0.0	4.5	2.4	0.0	2.4	1.4	0.7	3.2	3.0	1.5	2.1	1.5	1.7
Chemigation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Banded	0.0	20.2	8.8	0.0	0.0	20.8	2.4	6.8	12.8	7.9	20.9	3.0	31.9	5.6	9.2
Foliar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Injected (knifed in)	0.0	0.0	0.0	0.0	0.0	2.8	0.0	0.0	0.7	1.6	0.0	0.0	8.5	0.5	0.8
Herbicide: timing															
Before planting	49.8	52.9	38.3	52.5	80.2	32.9	56.9	66.4	46.1	71.1	50.2	56.7	45.3	36.7	56.1
At planting	16.9	22.1	23.9	26.8	29.2	27.7	31.1	5.1	6.5	3.2	1.8	6.4	27.8	14.5	10.7
After planting	59.7	27.9	64.4	73.7	82.3	58.8	80.2	74.0	53.9	72.2	79.1	50.0	45.3	54.9	65.6
Herbicide: appl. method															
Broadcast (ground)	70.3	68.4	80.0	79.9	93.8	70.0	77.8	92.9	67.7	89.1	82.6	82.2	70.1	78.1	81.9
Broadcast (air)	8.0	0.0	0.6	17.3	9.9	0.0	1.8	2.8	2.8	2.5	6.9	5.7	3.0	0.8	4.1
In-furrow	0.6	1.5	0.6	0.6	0.0	2.4	1.2	0.2	0.8	0.5	0.2	0.0	1.7	1.0	0.6
Chemigation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0
Banded	21.4	28.7	1.1	16.8	28.1	18.2	3.0	4.7	0.6	15.5	11.2	7.1	17.1	4.3	10.6
Directed spray	9.0	1.5	22.2	4.5	10.9	9.4	27.5	4.9	10.7	3.2	3.0	3.4	4.7	8.7	6.6
Average treatments/treated acre															
Fertilizer	1.05	1.11	1.15	1.00	1.00	1.05	1.16	1.53	1.24	1.03	1.07	1.02	1.09	1.16	1.16
Herbicide 3/	1.68	1.37	1.46	2.13	2.35	1.47	2.05	1.73	1.52	1.60	1.59	1.39	1.35	1.44	1.83
----- Percent of acre-treatments -----															
Fertilizer: timing															
Fall before planting	29.9	35.6	34.6	40.9	39.0	14.4	26.0	48.7	35.7	40.0	13.9	31.3	15.7	37.4	35.3
Spring before planting	56.9	42.3	47.4	40.9	58.5	55.0	66.7	43.8	48.1	49.2	62.5	59.7	33.3	53.0	50.7
At planting	12.4	21.2	15.4	13.6	2.4	28.8	7.3	6.7	12.4	6.2	18.1	7.5	39.2	8.3	11.7
After planting	0.7	1.0	2.6	4.5	0.0	1.8	0.0	.9	3.8	4.6	5.6	1.5	11.8	1.3	2.4
Fertilizer: appl. method															
Broadcast (ground)	97.1	79.8	91.0	95.5	97.6	77.5	95.8	94.2	88.1	87.7	77.8	95.5	52.9	93.5	89.6
Broadcast (air)	2.9	0.0	0.0	4.5	2.4	0.0	2.1	.9	0.5	3.1	2.8	1.5	2.0	1.3	1.4
Chemigation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Banded	0.0	20.2	9.0	0.0	0.0	19.8	2.1	4.5	10.8	7.7	19.4	3.0	35.3	4.8	8.1
Foliar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Injected (knifed in)	0.0	0.0	0.0	0.0	0.0	2.7	0.0	0.0	0.5	1.5	0.0	0.0	9.8	0.4	0.7
Herbicide: timing															
Before planting	38.4	55.7	29.1	31.1	38.1	28.7	30.4	44.5	41.6	47.9	32.4	51.2	38.7	32.2	40.8
At planting	13.0	19.0	18.4	19.1	12.4	21.0	17.2	3.4	6.8	2.2	1.5	5.5	23.3	15.3	8.1
After planting	48.5	25.3	52.4	49.8	49.5	50.2	52.3	52.0	51.5	49.9	66.1	43.3	37.9	52.6	51.0
Herbicide: appl. method															
Broadcast (ground)	67.7	72.1	79.4	74.4	74.5	72.6	72.5	90.7	83.1	84.7	84.0	85.0	75.5	85.9	82.6
Broadcast (air)	7.3	0.0	0.6	12.2	6.4	0.0	1.8	2.4	2.8	2.2	5.5	5.5	2.9	0.7	3.5
In-furrow	0.3	0.7	0.6	0.6	0.0	1.9	0.3	0.0	1.1	0.5	0.3	0.0	1.7	0.6	0.5
Chemigation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Banded	16.9	26.1	0.6	10.8	14.3	16.5	1.5	3.0	0.4	10.2	7.4	6.9	15.1	4.5	7.7
Directed spray	7.8	1.1	18.8	2.1	4.9	9.0	23.8	3.9	12.7	2.5	2.6	2.7	4.8	8.3	5.7

1/ Percents for a practice may add to more than 100 since an acre can be treated more than once with a same or a different practice. 2/ Revised planted acres, June 1994. 3/ Excludes spot treatments.

Source: Cropping Practices Survey, USDA.



Table 3--Chemical input practices on upland cotton, major producing States, 1993

Practice 1/	AZ	AR	CA	LA	MS	TX	Total
Planted acres (thousand) 2/	316	990	1,050	890	1,330	5,550	10,126
----- Percent of acres -----							
Fertilizer: timing							
Fall before planting	24.1	29.4	36.9	12.7	27.8	40.6	34.0
Spring before planting	15.2	65.1	36.9	53.2	61.6	46.4	49.1
At planting	2.5	7.9	20.1	11.4	10.6	4.9	8.1
After planting	97.5	74.6	56.4	50.6	86.1	36.5	53.9
Fertilizer: appl. method							
Broadcast (ground)	31.7	87.3	25.1	45.6	68.2	53.4	54.7
Broadcast (air)	7.6	5.6	3.9	5.1	7.3	6.4	6.1
Chemigation	57.0	0.0	12.3	0.0	0.0	4.6	5.8
Banded	8.9	19.8	20.1	15.2	33.1	25.4	23.8
Foliar	3.8	4.0	0.0	0.0	0.0	1.9	1.5
Injected (knifed in)	59.5	34.1	65.9	63.3	68.2	31.5	45.0
Herbicide: timing							
Before planting	66.7	59.2	65.4	50.0	70.4	76.5	70.2
At planting	4.4	63.1	7.8	67.4	72.3	34.2	41.4
After planting	34.8	91.5	26.8	79.4	98.7	25.4	46.8
Herbicide: appl. method							
Broadcast (ground) 3/	47.8	61.5	43.1	55.4	86.2	73.0	68.4
Broadcast (air)	29.0	13.9	2.6	12.0	3.8	7.8	8.4
In-furrow	4.4	2.3	3.9	9.8	4.4	2.4	3.5
Chemigation	0.0	1.5	0.0	0.0	0.0	0.0	0.2
Banded	8.7	74.6	11.1	66.3	74.2	37.2	44.8
Directed spray	8.7	43.9	27.5	32.6	60.4	2.5	19.6
Insecticide: timing:							
Before planting	0.0	2.3	0.0	2.2	0.6	0.9	1.0
At planting	0.0	21.5	13.7	14.1	20.8	14.5	15.5
After planting	85.5	86.2	91.5	97.8	95.0	32.2	59.1
Insecticide: appl. method							
Broadcast (ground) 3/	15.9	40.0	23.5	21.7	66.7	12.8	24.6
Broadcast (air)	79.7	43.9	45.1	80.4	69.2	17.5	37.1
In-furrow	0.0	21.5	7.8	7.6	16.4	7.5	9.9
Chemigation	1.5	1.5	0.0	0.0	0.0	0.0	0.2
Banded	1.5	24.6	10.5	34.8	33.3	14.0	18.6
Directed spray	4.4	6.2	42.5	16.3	2.5	3.8	8.8
----- Number -----							
Average treatments/treated acre							
Fertilizer	3.06	2.18	1.73	1.47	2.17	1.47	1.84
Herbicide 4/	1.30	3.76	1.37	4.56	4.00	1.60	2.40
Insecticide 4/	6.03	4.90	2.05	6.86	9.05	2.87	4.88
----- Percent of acre-treatments -----							
Fertilizer: timing							
Fall before planting	10.3	16.4	23.0	8.6	12.8	30.0	21.2
Spring before planting	5.0	34.5	21.7	47.4	34.1	35.8	32.6
At planting	.8	3.6	11.7	7.8	4.9	3.0	4.6
After planting	83.9	45.5	43.7	36.2	48.2	31.2	41.6
Fertilizer: appl. method							
Broadcast (ground) 3/	11.6	65.1	19.0	37.9	36.0	45.5	40.7
Broadcast (air)	4.1	3.6	2.3	6.0	4.0	4.8	4.3
Chemigation	41.3	0.0	7.1	0.0	0.0	3.3	4.9
Banded	3.7	10.2	16.5	12.1	19.8	20.9	16.9
Foliar	2.1	2.5	0.0	0.0	0.0	1.3	1.0
Injected (knifed in)	37.2	18.5	55.0	44.0	40.2	24.2	32.2
Herbicide: timing							
Before planting	67.2	18.9	73.0	18.8	19.0	62.0	48.6
At planting	3.0	21.8	7.0	27.6	18.7	20.4	19.3
After planting	29.8	59.3	20.0	53.5	62.2	17.5	32.0
Herbicide: appl. method							
Broadcast (ground) 3/	48.9	26.6	50.3	22.8	37.5	63.7	50.9
Broadcast (air)	31.4	5.4	2.8	5.0	0.8	7.4	6.4
In-furrow	2.2	1.5	3.5	3.1	1.1	2.4	2.3
Chemigation	0.0	0.8	0.0	0.0	0.0	0.0	0.0
Banded	8.3	44.0	12.3	47.5	32.2	25.1	28.5
Directed spray	9.2	21.7	31.1	21.6	28.3	1.4	11.8
Insecticide: timing:							
Before planting	0.0	0.8	0.0	0.2	0.0	1.2	0.6
At planting	0.0	7.3	8.2	2.3	2.5	26.6	12.4
After planting	100	91.9	91.8	97.4	97.5	72.2	87.1
Insecticide: appl. method							
Broadcast (ground) 3/	8.5	30.7	18.2	17.2	36.8	22.5	24.5
Broadcast (air)	86.7	41.0	34.9	62.5	51.0	31.9	43.6
In-furrow	0.0	8.0	4.2	0.8	2.1	13.2	6.9
Chemigation	1.1	1.0	0.0	0.0	0.0	0.0	0.1
Banded	0.7	13.7	7.5	14.2	9.4	25.6	15.7
Directed spray	4.0	5.6	35.2	5.4	0.7	6.8	9.3

1/ Percents for a practice may add to more than 100 since an acre can be treated more than once with a same or a different practice. 2/ Revised planted acres, June 1994. 3/ Includes knifed in. 4/ Excludes spot treatments.

Source: Cropping Practices Survey, USDA.

Table 4--Chemical input practices on durum wheat and spring wheat,  
major producing States, 1993

Practice 1/	Durum	Spring				Total
	ND	MN	MT	ND	SD	
Planted acres (million) 2/	1.95	2.70	2.75	9.60	2.20	17.25
----- Percent of acres -----						
Fertilizer: timing						
Fall before planting	46.3	45.2	15.1	35.2	27.7	37.6
Spring before planting	40.0	59.7	11.3	36.2	46.8	38.3
At planting	76.8	50.0	94.3	79.1	52.1	72.9
After planting	0.0	3.2	9.4	1.9	2.1	3.0
Fertilizer: appl. method						
Broadcast (ground)	14.7	53.2	22.6	24.8	61.7	33.3
Broadcast (air)	0.0	4.8	0.0	0.0	2.1	1.0
Chemigation	0.0	0.0	0.0	0.0	4.3	0.5
Banded/In-furrow	76.8	54.8	96.2	81.0	40.4	73.9
Injected (knifed in)	73.7	46.8	13.2	57.1	17.0	45.8
Herbicide: timing						
Before planting	23.7	6.2	8.5	16.4	1.7	11.8
At planting	0.8	0.0	1.2	0.9	0.0	0.7
After planting	84.7	84.6	90.2	90.0	89.7	89.2
Herbicide: appl. method						
Broadcast (ground)	78.8	75.4	72.0	80.0	72.4	77.1
Broadcast (air)	4.2	13.9	22.0	16.4	17.2	17.0
In-furrow	0.0	0.0	0.0	2.7	0.0	1.6
Chemigation	0.0	0.0	1.2	0.9	0.0	0.7
Average treatments/treated acre			Number			
Fertilizer	1.72	1.68	1.32	1.66	1.36	1.54
Herbicide 3/	1.33	1.30	1.09	1.25	1.05	1.21
----- Percent of acre-treatments -----						
Fertilizer: timing						
Fall before planting	27.6	27.9	12.9	24.7	20.3	23.7
Spring before planting	26.4	39.4	8.6	23.0	39.1	25.9
At planting	46.0	30.8	71.4	51.1	39.1	48.5
After planting	0.0	1.9	7.1	1.1	1.6	1.9
Fertilizer: appl. method						
Broadcast (ground)	8.6	32.7	17.1	14.9	46.9	21.3
Broadcast (air)	0.0	2.9	0.0	0.0	1.6	.6
Chemigation	0.0	0.0	0.0	0.0	3.1	0.3
Banded/In-furrow	45.4	35.6	72.9	50.0	31.3	47.9
Injected (knifed in)	46.0	28.8	10.0	35.1	17.2	29.8
Herbicide: timing						
Before planting	15.7	5.3	5.8	10.6	1.0	7.9
At planting	0.9	0.0	0.6	1.0	0.0	0.7
After planting	83.4	94.7	93.5	88.5	99.0	91.4
Herbicide: appl. method						
Broadcast (ground)	95.4	85.1	76.0	81.6	80.8	81.1
Broadcast (air)	4.6	14.9	22.7	15.1	19.2	16.8
In-furrow	0.0	0.0	0.0	2.4	0.0	1.4
Chemigation	0.0	0.0	1.3	1.0	0.0	0.8

1/ Percents for a practice may add to more than 100 since an acre can be treated more than once with a same or a different practice. 2/ Revised planted acres, June 1994.

3/ Excludes spot treatments.

Source: Cropping Practices Survey, USDA.



Table 5--Chemical input practices on winter wheat, major producing States, 1993

Practice 1/	CO	ID	IL	KS	MO	MT	NE	OH	OK	OR	SD	TX	WA	Total
Harvested acres (thousand) 2/	2550	850	1550	11100	1400	2450	2100	1010	5400	860	1450	3700	2500	36920
----- Percent of acres -----														
Fertilizer: timing														
Fall before planting	75.1	62.8	71.8	82.7	58.7	45.3	83.7	79.6	78.3	83.6	12.1	71.8	85.5	74.8
Spring before planting	0.0	0.0	0.0	0.0	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.2
At planting	5.9	19.7	9.5	24.2	19.2	84.3	19.5	15.6	27.1	15.3	73.7	11.1	15.3	25.2
After planting	24.6	59.9	86.5	38.0	65.7	20.8	34.4	88.4	46.1	42.9	43.6	40.0	18.7	41.8
Fertilizer: appl. method:														
Broadcast (ground)	32.2	63.9	97.3	55.1	90.7	25.8	50.7	98.7	58.5	47.8	51.7	59.5	15.8	54.4
Broadcast (air)	2.0	13.2	2.8	3.1	7.6	1.3	1.4	4.0	8.1	18.8	4.0	5.5	9.3	5.2
Chemigation	0.0	8.8	5.3	0.0	1.7	0.0	0.0	2.9	0.6	0.0	0.0	4.7	2.0	1.3
Banded/In-furrow	7.9	15.3	0.0	21.2	0.0	86.5	19.5	1.3	21.2	9.2	69.7	9.6	12.7	21.2
Injected (knifed in)	69.5	32.1	0.0	58.9	2.3	38.0	54.9	0.0	49.6	66.1	0.0	31.1	79.1	46.7
Herbicide: timing														
Before planting	3.9	21.1	0.0	4.2	0.0	3.3	5.0	0.0	1.1	13.2	10.8	2.7	9.9	3.9
At planting	0.0	0.0	1.3	0.4	0.0	2.0	1.1	0.0	1.1	0.0	3.6	0.6	1.3	0.8
After planting	19.4	96.5	19.8	35.8	6.3	96.9	34.0	15.4	28.1	92.8	57.2	20.9	86.2	40.6
Herbicide: appl. method														
Broadcast (ground)	18.1	58.8	18.5	34.0	4.6	61.0	30.8	15.4	24.1	60.3	24.9	15.0	37.9	30.0
Broadcast (air)	3.9	34.5	2.6	4.8	1.7	38.1	6.1	0.0	5.1	40.9	37.7	8.6	51.6	13.0
In-furrow	0.0	0.0	0.0	0.0	0.0	0.9	2.1	0.0	0.0	0.0	0.0	0.0	3.6	0.4
Chemigation	0.0	5.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	0.3
Average treatments/treated acre														
Fertilizer	1.15	1.58	2.35	1.62	1.45	1.56	1.35	2.07	1.62	1.55	1.31	1.38	1.24	1.56
Herbicide 3/	1.06	1.19	1.00	1.08	1.00	1.12	1.17	1.00	1.19	1.37	1.20	1.02	1.22	1.12
----- Percent of acre-treatments -----														
Fertilizer: timing														
Fall before planting	73.5	42.1	53.4	60.7	41.7	29.8	61.0	44.8	53.1	51.3	9.1	58.3	70.5	54.9
Spring before planting	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.1
At planting	5.1	13.5	8.6	15.2	13.1	55.5	14.1	8.1	16.7	9.0	55.2	8.1	13.7	16.8
After planting	21.4	44.5	37.9	24.0	45.2	13.9	24.9	47.1	30.2	39.7	35.7	33.1	15.8	28.2
Fertilizer: appl. method:														
Broadcast (ground)	28.0	54.2	96.0	45.6	88.1	17.1	45.8	96.1	50.9	40.4	44.8	57.5	13.1	50.4
Broadcast (air)	1.7	8.4	1.2	1.9	9.1	0.8	1.0	1.9	4.9	12.9	3.0	5.0	7.4	3.6
Chemigation	0.0	5.6	2.8	0.0	1.2	0.0	0.0	1.3	0.3	0.0	0.0	4.9	1.6	1.0
Banded/In-furrow	6.8	11.4	0.0	13.3	0.0	56.9	13.1	0.6	13.2	5.9	52.2	7.5	11.1	13.9
Injected (knifed in)	63.5	20.5	0.0	39.1	1.6	25.1	40.1	0.0	30.7	40.9	0.0	25.1	66.8	31.1
Herbicide: timing														
Before planting	16.8	1.4	0.0	10.5	0.0	1.7	9.9	0.0	3.6	9.3	12.4	11.1	6.9	7.4
At planting	0.0	0.0	6.2	0.9	0.0	1.5	2.8	0.0	3.6	0.0	2.4	2.3	1.4	1.6
After planting	83.2	98.6	93.8	88.6	100	96.8	87.3	100	92.8	90.7	85.2	86.6	91.6	91.0
Herbicide: appl. method														
Broadcast (ground)	82.2	59.6	87.6	87.7	72.9	61.2	80.3	100	82.4	59.7	38.9	63.5	39.6	68.9
Broadcast (air)	17.8	35.0	12.4	12.3	27.1	37.8	16.0	0.0	17.6	40.3	61.1	36.5	55.5	29.7
In-furrow	0.0	0.0	0.0	0.0	0.0	1.0	3.7	0.0	0.0	0.0	0.0	0.0	2.3	0.7
Chemigation	0.0	5.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.7	0.7

1/ Percents in any column may add to more than 100 since an acre can be treated more than once with a same or a different practice. 2/ Revised harvested acres, June 1994. 3/ Excludes sport treatments.

Source: Cropping Practices Survey, USDA.

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Practice 1/	CO	ID	ME	MI	MN	NY	ND	OR	PA	WA	WI	Total
Planted acres (thousand) 2/	72.5	390	81	40	70	28.8	143	50.4	21	150	71.5	1118.2
	----- Percent of acres -----											
Fertilizer: timing												
Fall before planting	8.7	39.6	0.6	18.7	11.0	12.7	20.9	26.7	1.2	54.6	40.2	29.7
Spring before planting	46.4	63.1	0.6	66.7	42.0	14.2	60.9	61.1	18.3	35.7	37.6	48.6
At planting	37.7	22.7	96.9	85.3	59.7	84.9	33.0	26.9	92.7	26.6	90.6	42.9
After planting	6.7	85.2	24.5	92.0	27.9	16.3	21.7	74.2	50.0	61.0	94.9	62.4
Fertilizer: appl. method												
Broadcast (ground)	40.6	89.6	14.5	98.7	49.0	34.5	71.3	77.2	39.0	81.8	88.0	72.2
Broadcast (air)	0.0	14.9	1.9	4.0	3.7	12.1	8.7	4.0	0.0	6.5	3.4	8.4
Chemigation	53.6	67.7	0.0	0.0	3.0	0.0	7.0	62.7	0.0	61.0	37.6	41.3
Banded	66.7	40.2	98.7	90.7	75.4	71.4	47.0	50.2	96.3	22.7	94.9	54.6
Foliar	1.5	2.6	7.6	1.3	0.0	0.0	2.6	0.0	3.7	0.0	6.8	2.4
Injected (knifed in)	17.4	3.2	0.6	10.7	12.8	0.0	20.9	8.3	2.4	0.7	8.6	7.2
Herbicide: timing												
Before planting	3.1	27.7	1.4	37.7	25.9	20.0	1.8	15.9	25.6	24.6	6.8	18.6
At planting	0.0	6.1	1.4	8.7	0.0	0.0	0.0	1.5	2.6	3.2	1.7	3.2
After planting	68.8	66.8	86.3	55.1	44.7	70.4	50.0	71.8	74.4	74.6	85.5	66.9
Herbicide: appl. method												
Broadcast (ground) 3/	4.7	55.3	24.5	73.9	52.0	21.9	25.4	34.6	60.3	25.4	78.6	42.2
Broadcast (air)	10.9	9.6	0.7	8.7	15.6	14.3	21.9	13.0	0.0	24.6	5.1	12.8
In-furrow	0.0	2.9	0.0	0.0	0.0	0.0	5.3	0.0	0.0	0.0	0.0	1.7
Chemigation	54.7	25.3	0.0	0.0	0.0	0.0	0.0	33.6	0.0	47.6	0.0	20.1
Banded	0.0	1.5	1.4	2.9	0.0	0.0	1.8	0.0	1.3	0.8	3.4	1.3
Directed spray	1.6	10.2	60.4	10.1	1.5	48.6	0.0	2.8	18.0	4.0	6.8	11.2
Insecticide: timing												
Before planting	0.0	10.6	0.0	7.3	0.0	5.7	0.0	11.2	3.9	15.9	0.0	6.8
At planting	0.0	40.8	10.8	33.3	8.3	5.7	19.3	18.5	30.8	22.2	16.2	24.7
After planting	62.5	44.1	97.1	94.2	92.3	91.4	92.1	77.2	98.7	94.4	95.7	73.8
Insecticide: appl. method												
Broadcast (ground) 3/	4.7	14.4	29.5	56.5	50.7	26.6	62.3	34.3	66.7	31.0	53.0	31.7
Broadcast (air)	35.9	26.6	2.2	37.7	41.8	19.7	36.0	60.7	10.3	73.0	35.0	35.7
In-furrow	0.0	22.4	9.4	8.7	11.8	2.9	7.9	3.4	16.7	8.7	4.3	12.6
Chemigation	21.9	7.5	0.0	0.0	0.0	0.0	0.0	5.7	0.0	30.2	4.3	8.5
Banded	0.0	26.3	3.6	15.9	14.1	5.7	11.4	24.5	3.9	21.4	17.1	17.6
Directed spray	0.0	0.6	64.8	11.6	2.4	47.2	0.0	0.0	19.2	2.4	6.8	7.8
Fungicide: timing												
Before planting	1.6	1.5	0.0	10.1	0.0	2.7	0.0	0.0	0.0	0.4	0.0	1.4
At planting	0.0	1.5	0.0	1.5	0.0	0.0	0.0	0.0	0.0	3.2	0.0	1.0
After planting	90.6	47.0	97.1	92.8	95.7	87.2	93.0	78.7	91.0	84.1	98.3	75.5
Fungicide: appl. method												
Broadcast (ground) 3/	4.7	3.1	29.5	55.1	40.5	26.2	59.7	9.4	62.8	11.9	53.9	23.0
Broadcast (air)	28.1	33.2	2.2	37.7	62.1	17.0	56.1	45.9	10.3	58.7	36.8	38.9
In-furrow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	2.4	0.0	0.3
Chemigation	67.2	11.1	0.0	0.0	1.5	0.0	2.6	40.1	0.0	47.6	5.1	17.0
Banded	0.0	2.7	3.6	0.0	6.6	0.0	2.6	0.0	1.3	5.6	3.4	2.9
Directed spray	1.6	1.9	64.8	10.1	3.9	51.8	0.0	0.0	15.4	0.0	8.6	8.3
Average treatments/treated acre	----- Number -----											
Fertilizer	2.62	2.77	1.30	3.55	1.84	1.22	2.14	2.67	1.84	2.05	4.62	2.42
Herbicide 4/	1.07	1.39	1.09	1.45	1.27	1.35	1.44	1.41	1.58	1.39	1.33	1.35
Insecticide 4/	1.05	1.35	2.56	5.28	1.96	4.74	1.78	2.50	5.33	2.81	2.43	2.22
Fungicide 4/	1.83	1.55	8.17	5.38	3.39	5.14	3.88	2.58	6.08	3.39	6.64	3.80
	----- Percent of acre-treatments -----											
Fertilizer: timing												
Fall before planting	3.3	15.7	0.5	5.3	8.8	9.6	11.4	10.4	.7	30.7	9.3	13.2
Spring before planting	19.9	24.7	0.5	24.4	24.4	10.7	43.5	30.4	11.3	19.9	9.8	23.2
At planting	17.7	8.4	76.7	27.1	39.7	65.8	15.4	10.9	53.0	14.6	20.0	18.5
After planting	59.1	51.2	22.3	43.2	27.1	13.9	29.7	48.2	35.1	34.8	60.9	45.1
Fertilizer: appl. method												
Broadcast (ground)	19.9	44.7	12.6	60.9	33.6	33.7	41.5	43.3	31.1	48.7	39.4	41.1
Broadcast (air)	0.0	7.1	1.5	1.1	1.8	9.2	4.9	2.3	0.0	3.5	0.7	4.2
Chemigation	42.5	30.9	0.0	0.0	1.4	0.0	20.7	31.6	0.0	32.3	18.7	24.2
Banded	30.4	14.9	79.1	33.8	55.5	57.1	22.0	19.8	61.6	15.2	34.3	26.0
Foliar	0.6	1.1	6.3	0.4	0.0	0.0	1.2	0.0	6.0	0.0	2.6	1.2
Injected (knifed in)	6.6	1.3	0.5	3.8	7.8	0.0	9.8	3.0	1.3	0.3	4.3	3.3
Herbicide: timing												
Before planting	4.3	26.1	1.2	34.4	35.9	20.2	3.4	13.8	18.3	21.8	6.5	19.1
At planting	0.0	5.7	0.6	8.2	0.0	0.0	0.0	1.2	1.6	1.8	1.9	3.1
After planting	95.7	68.1	98.2	57.4	64.1	79.8	96.6	84.9	80.1	76.4	91.7	77.8
Herbicide: appl. method												
Broadcast (ground) 3/	6.5	55.9	28.1	79.5	76.2	25.8	45.9	41.8	76.7	23.6	84.3	48.4
Broadcast (air)	15.2	7.4	0.8	9.8	22.7	16.8	41.5	14.8	0.0	24.5	4.6	13.8
In-furrow	0.0	2.0	0.0	0.0	0.0	0.0	10.2	0.0	0.0	0.0	0.0	1.6
Chemigation	76.1	23.4	0.0	0.0	0.0	0.0	0.0	40.4	0.0	46.7	0.0	22.0
Banded	0.0	1.5	1.7	3.3	0.0	0.0	2.4	0.0	1.7	0.9	3.7	1.4
Directed spray	2.2	9.8	69.4	7.4	1.1	57.3	0.0	3.0	21.7	4.3	7.4	12.9
	----- continued next page -----											



Table 6--Chemical input practices on fall potatoes, major producing States, 1993 --continued

Practice 1/	CO	ID	ME	MI	MN	NY	ND	OR	PA	WA	WI	Total
----- Percent of acre-treatments -----												
Insecticide: timing												
Before planting	0.0	9.8	0.0	4.7	0.0	1.4	0.0	6.6	0.7	6.7	0.0	4.6
At planting	0.0	44.0	4.5	9.3	4.4	1.1	10.8	11.4	5.4	9.0	7.2	18.9
After planting	100	46.2	95.5	85.9	95.6	97.5	89.2	82.0	94.0	84.3	92.8	76.5
Insecticide: appl. method												
Broadcast (ground) 3/	7.5	14.7	28.5	48.8	47.4	28.2	57.6	20.1	66.3	17.8	51.7	29.8
Broadcast (air)	57.5	25.7	1.8	36.0	36.9	21.2	32.6	56.7	10.0	51.8	28.6	32.3
In-furrow	0.0	24.9	4.0	2.3	5.9	0.4	4.3	2.1	3.2	2.5	2.4	100
Chemigation	35.0	7.6	0.0	0.0	0.0	0.0	0.0	3.8	0.0	16.7	1.7	6.8
Banded	0.0	26.6	2.7	4.7	7.9	1.1	5.6	17.3	1.8	10.2	9.4	13.1
Directed spray	0.0	0.5	62.9	8.2	1.8	49.1	0.0	0.0	18.7	1.0	6.3	8.0
Fungicide: timing												
Before planting	1.7	2.6	0.0	9.8	0.0	3.2	0.0	0.0	0.0	0.7	0.0	1.4
At planting	0.0	2.7	0.0	1.5	0.0	0.0	0.0	0.0	0.0	2.4	0.0	1.0
After planting	98.3	94.7	100	88.8	100	96.8	100	100	100	97.0	100	97.6
Fungicide: appl. method												
Broadcast (ground) 3/	5.1	6.0	29.2	52.6	36.4	27.0	51.9	11.9	70.0	10.1	51.7	26.4
Broadcast (air)	26.3	64.8	2.1	57.1	58.4	18.4	44.9	45.0	11.1	50.3	33.3	43.1
In-furrow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.9	0.0	0.1
Chemigation	66.9	21.0	0.0	0.0	1.6	0.0	2.5	43.1	0.0	33.9	3.1	17.5
Banded	0.0	4.7	3.0	0.0	1.7	0.0	0.7	0.0	1.4	4.7	3.5	2.6
Directed spray	1.7	3.5	65.6	10.3	1.9	54.6	0.0	0.0	17.1	0.0	8.4	10.3

1/ Percents for a practice may add to more than 100 since an acre can be treated more than once with a same or a different practice. 2/ Revised planted acres, June 1994. 3/ Includes knifed in. 4/ Excludes spot treatments. Source: Cropping Practices Survey, USDA.

#### RTD UPDATES

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